

IN VIVO EFFICACY OF ALBENDAZOLE IN GAROLE SHEEP AND BLACK BENGAL GOAT OF SUNDARBAN DELTA OF WEST BENGAL

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ABSTRACT

Insidious diseases caused by helminth parasites are a major hindrance for optimum productivity in small ruminants. The present study was conducted to determine the efficacy of albendazole *in vivo* by faecal egg count reduction test (FECRT) in goat and sheep naturally infected with gastrointestinal (G.I.) parasites in the selected places of Sundarban Delta of South 24 Parganas district in West Bengal. A total of sixty (60) Garole sheep and black-Bengal goat in the age group of three months to one year were selected and coprologically screened by standard technique for a period of one year (from Oct 2012 – September 2013) for presence of G.I. parasite. The efficacy of albendazole in sheep was in the desired range i.e. 95.10- 96.81%, whereas an optimum efficacy of 87.50 - 92.86% was observed in black Bengal goat of Sundarban Delta (South 24 Parganas) respectively. The results of the present study might be helpful in planning out an integrated approach along with judicious use of anthelmintic for managing and checking naturally occurring gastrointestinal helminthoses in the small ruminants with fruitful outcome.

KEYWORDS: Gastrointestinal Parasites, Prevalence, Intensity, Garole Sheep, Black-Bengal Goat, West Bengal

INTRODUCTION

Profitable animal husbandry in small ruminant livestock with fruitful monetary gains is a major economic source of most of the landless and poor farmers of rural area. Goat with its unique feature of providing maximum returns with minimum care and expenditure has hence made it the most popular livestock of the rural India. Goat & sheep rearing as an economic venture has, of late, picked up considerable momentum in rural India including West Bengal, however profitable goat & sheep husbandry confronts a variety of constraints of which disease problem is the major hindrance for optimum productivity. Among various diseases, parasitic disease is the major constraint which leads to significant economic losses attributable to reduced weight gain, retarded growth and impaired productive and reproductive efficiency [1, 2, 3]. Nevertheless, systematic study on gastrointestinal parasites in black-Bengal goat and Garole sheep is lacking and it continues to be a major limiting factor for their optimal productivity. Epidemiological studies in this regard play an essential role to utilise the disease data for diagnostic purposes, that helps in creating disease control strategies and also assess the relationship between climatological factors and pathogens and thereby health status of animals.

Therefore, the present study was conducted to determine the efficacy of albendazole *in vivo* against naturally occurring gastrointestinal (G.I.) parasites in Garole sheep and black-Bengal goat of Sundarban *Delta* of West Bengal.

MATERIALS AND METHODS

Study Location

Rangabelia and Jotirampur are the two villages under the block Gosaba located in the Sundarban *Delta* in South 24 Parganas district of West Bengal where along with black-Bengal goat, Garole sheep is also the major livestock species. Black-Bengal goat and Garole sheep were selected for the study of 12 months' total duration. In the selected villages, routine deworming was not practiced by farmers and the animals were maintained by semi-intensive system of rearing.

Selection of Animals and Collection of Faecal Samples

A total number of 60 Garole sheep and black-Bengal goat of either sex, age 3 to 12 months were designated for the study, properly identified by neck tags and maintained as per the owners' practices in the selected locations.

Examination of Faecal Sample

A part of each sample was subjected to qualitative faecal examination by standard sedimentation technique for the presence of trematode eggs and salt flotation technique for cestode and nematode eggs [4]. Quantitative faecal examination of the remaining part of the samples was performed according to Modified McMaster's Technique by Soulsby 1982 [4].

Evaluation of Anthelmintic Efficacy

The *in vivo* evaluation of anthelmintic efficacy and/or resistance under field condition was done by faecal egg count reduction test (FECRT) following the standard guidelines of W.A.A.V.P. [5]. As stated earlier that albendazole was the primary drug used as an anthelmintic, therefore the efficacy of albendazole was evaluated with a view to detect any emergence of anthelmintic resistance in the selected study locations. Faecal samples of all the selected animals were examined quantitatively by Mc. Master's technique [4] three days before giving treatment and the animals having epg (Egg per gram) count ≥ 200 number were selected for anthelmintic evaluation.

The animals in the selected study locations were divided into two groups; treated group (comprising of minimum of 10 animals and maximum of 15 animals) and infected group (comprising minimum of 5 animals and maximum of 10 animals). Faecal samples of both the treated and infected groups were examined quantitatively on the day of giving the treatment i.e. on "0" (zero) day pre treatment (ODPT). All the animals of treated groups in the selected places were treated with albendazole @ 5 mg/kg b. wt. (Albomar® Virbac) orally. On ten days post treatment (10 DPT) faecal samples of both treated and infected groups were examined quantitatively. Efficacy of albendazole was estimated by the following formula:

$$\% \text{ Efficacy} = [(\text{Mean EPG in control group} - \text{Mean EPG in treated group}) / \text{Mean EPG in control group}] \times 100$$

Efficacy of Albendazole was evaluated three times by the faecal egg count reduction test (FECRT) once on December 2012, March 2013, and again on June 2013.

RESULTS AND DISCUSSIONS

In the present study, desired efficacy of albendazole was observed in the unorganised farming conditions of West Bengal. The Table 1 represents the efficacy results of G.I. nematode in Garole sheep at Rangabelia and Jotirampur villages

of South 24 Paraganas District of West Bengal. Highest efficacy of albendazole was observed in sheep of selected areas. High efficacy might be due to the fact that routine deworming was not followed in that village and therefore selection for resistant worm population is rare.

Table 1: Efficacy of Albenadazole against Naturally Occurring G. I. Nematode in Garolesheep

Occasions	Treated Group (Egg Count) (n=15)		Control Group (Egg Count) (n=10)		% Efficacy
	Pre Treatment	Post Treatment	Pre Treatment	Post Treatment	
1 st	400	15	450	470	96.81
2 nd	460	20	480	520	96.15
3 rd	450	10	420	400	95.12

Table 2: Efficacy of Albenadazole against Naturally Occurring G. I. Nematode in Black- Bengal Goat

Occasions	Treated Group(Egg Count) (n=15)		Control Group(Egg Count) (n=10)		% Efficacy
	Pre Treatment	Post Treatment	Pre Treatment	Post Treatment	
1 st	350	30	370	360	91.67
2 nd	310	40	300	320	87.50
3 rd	320	25	360	350	92.86

The Efficacy of albendazole in goats of village Rangabelia and Jotirampur, South 24 Paraganas was also in the desired range (Table 2). Although routine deworming is practiced in those village on black-Bengal goat population, but the frequency of anthelmintic treatment is less and the pasture for grazing is a vast area and thereby diluting the concentration of resistant parasitic population, if any. The above factors might be responsible formaintaining the optimum efficacy of albendazole as recorded. Higher efficacy of albendazole and other benzimidazole drugs have been reported earlier by Panda *et al.*, 2003 [6]; Gomathinayagamet *al.*, 2004 [7]; Garg *et al.*, 2007[8] and Panditet *al.*, 2009[9] which were consensus with the present findings.

Better management practice and use of combination of other anthelmintic group along with benzimidazole might be responsible for maintaining comparatively higher efficacy of albendazole in Sundarban *Delta* (South 24 Paraganas) and thereby check emergence of benzimidazole resistance. Moreover vast grazing land also another good attributing factor. Resistance to benzimidazole group of anthelmintics is a worldwide threat to the control of nematodes [10, 11]. But Garole sheep and black-Bengal goats of the selected locations for study is totally devoid of albendazole resistant which is favourable for clinical judicious use of anthelmintic.

CONCLUSIONS

The efficacy of albendazole in the small ruminants of Sundarban delta appears in sound and satisfactory range, inspite of indiscriminate use of benzimidazole group of drug in the adjoining areas of West Bengal. Therefore the present finding in the concluded research should be properly exploited to make the villagers aware of the consequences of emergence of drug resistance and thence judicious use of the anthelminthics and thereby also suggest them to imply other eco-friendly integrated practices for strategic worm control programme in small ruminants to prevent economic losses to the farmers.

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